

**Appendix B**  
**Clean Copy of Claims as Amended**

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E4 1. An array of at least two different chemical compounds attached to a support, wherein the array has linear organization;

wherein each chemical compound is represented in the array at least twice at discontinuous regions of the array;

wherein the chemical compounds are not intermediates leading to a single final product; and

wherein the chemical compounds are members of a combinatorial library.

2. An array of at least two different chemical compounds attached to a support, wherein the array has linear organization; wherein each chemical compound is represented in the array at least twice at discontinuous regions of the array; wherein the chemical compounds are members of a combinatorial library;

and wherein the array is prepared by a method which comprises steps of:

providing a support having reactive functionalities;

subjecting said support to a first set of reagents or reaction conditions, wherein each of said first reagents or reaction conditions cycles with a first specific spatial period along the support, and wherein each individual first reagent or reaction condition in the set is identified as a function of a unique distance or time, so that a first set of compounds is produced simultaneously on the array, each compound within first set being related to all other compounds in the first set as a product of the first set of reagents or reaction conditions, and being separated from other first set compounds by the first specific spatial period; and

subjecting said support to one or more additional set of reagents or reaction conditions, wherein each of said additional reagents or reaction conditions cycles with a second specific spatial period along the support, and wherein each individual reagent or reaction conditions in said one or more additional sets is identified as a second function of unique distance or time, so that at least one additional set of compounds is produced simultaneously on

the array, each compound within the additional set being related to all other compounds in the additional set as a product of the additional set of reagents or reaction conditions, and being separated from other additional set compounds by the second specific spatial period, until a desired array of compounds is obtained.

3. An array of at least two different chemical compounds attached to a support, wherein the array has linear organization; wherein each chemical compound is represented in the array at least twice at discontinuous regions of the array; wherein the chemical compounds are members of a combinatorial library; and

wherein the array is prepared by a method which comprises the steps of:

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*CM*
- a) providing a support having reactive functional groups,
  - b) winding the support around a geometric template,
  - c) dividing the surface of the template lengthwise into regions,
  - d) subjecting each region to one or more reagents or reaction conditions so as to attach

reactive moieties or to modify the functional groups attached directly to the support or comprising reactive moieties, and thereby to simultaneously create a set of compounds on the support in which each compound in a set is related to all other compounds in the set as a product of the reagents or reaction conditions that the region was subjected to; and

- e) repeating steps (b) through (d) until the desired library is obtained.

4. The array of claim 3, wherein the reactive moieties attached in step (d) comprise additional functional groups which are masked by protecting groups, and wherein these protecting groups are removed prior to treatment with one or more reagents or reaction conditions.

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5. The array of claim 1, wherein the identity of each compound in said array is uniquely specified by its location on the support.

6. The array of claim 1, wherein each of said compounds is synthesized from one or more

reagents, and wherein each of said one or more reagents is added at a specific repeat frequency, defined at a specific location on the support.

7. The array of claim 1, wherein the compounds are arranged one-dimensionally.
37. The array of claim 1, wherein the compounds are arranged linearly on the support.
38. The array of claim 1, wherein at least one compound is present at at least two different positions on the support.
39. The array of claim 1, wherein at least two compounds are each present at at least two different positions on the support, successive occurrences of each compound being separated by a constant interval.
40. The array of claim 1, wherein at least one compound is present at at least three different positions on the support, successive occurrences of the compound being separated by a constant interval.
41. The array of claim 1, wherein all compounds are present at at least two different positions on the support, successive occurrences of each compound being separated by a constant interval.
42. The array of claim 1, wherein each different compound is present at only one position on the support.
43. The array of claim 1, wherein the support has at least two distinct portions and the array comprises at least a first synthesis product attached to a first portion and a second synthesis product attached to a second portion.

44. The array of claim 43, wherein one or both of said first and second synthesis products include a plurality of distinct chemical structures.

45. The array of claim 43, wherein one or both of said first and second synthesis products include single chemical structures.

46. The array of claim 43, wherein both of said first and second synthesis products include single chemical structures.

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